Log Event A

Borehole # 10-02-08

Borehole Information

Farm : A	**Tank :** A-102	**Site Number :** 299-E25-87
N-Coord : 41,184	**W-Coord :** 47,746	**TOC Elevation :** 689.42
Water Level, ft : 125.50	**Date Drilled :** 4/30/62	

Casing Record

Type : Steel-welded	Thickness, in. : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 125	

Cement Bottom, ft. : 18 **Cement Top, ft. :** 0

Borehole Notes:

Borehole 10-02-08 was originally drilled in April 1962 and completed at a depth of 75 ft with 6-in. casing. In 1978, the borehole was deepened to 125 ft. A temporary 8-in. overshot casing was driven over the original 6-in. casing to a depth of 18 ft to deepen the borehole. The 6-in. casing was driven to a depth of 130 ft and then retracted to 125 ft. Nine gal of cement grout was placed in the bottom 5 ft of the borehole. The temporary 8-in. casing was removed. Thirty-six gal of cement grout was injected into the annular space between the permanent 6-in. casing and the borehole wall as the 8-in. casing was retracted. Drilling records do not indicate the casing was perforated.

"As-built" drawings for the A Tank Farm indicate the original borehole was constructed with 6-in., schedule-30 pipe. This type of pipe was not identified in engineering references such as Driscoll (1986). The casing thickness for the borehole is assumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. casing.

The top of the casing is the zero reference for the log. The casing lip is approximately even with the ground surface.

Equipment Information

Logging System : 2	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 10/1996	**Calibration Reference :** GJO-HAN-13	**Logging Procedure :** P-GJPO-1783

Logging Information

Log Run Number : 1	**Log Run Date :** 11/08/1996	**Logging Engineer:** Bob Spatz
Start Depth, ft.: 0.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 2.5	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

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Log Run Number :	2	**Log Run Date :**	11/08/1996	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	3.0	**Counting Time, sec.:**	100	**L/R :** R **Shield :**	N
Finish Depth, ft. :	6.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a
Log Run Number :	3	**Log Run Date :**	11/08/1996	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	6.5	**Counting Time, sec.:**	100	**L/R :** L **Shield :**	N
Finish Depth, ft. :	25.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a
Log Run Number :	4	**Log Run Date :**	11/11/1996	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	126.0	**Counting Time, sec.:**	100	**L/R :** L **Shield :**	N
Finish Depth, ft. :	70.5	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a
Log Run Number :	5	**Log Run Date :**	11/12/1996	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	71.5	**Counting Time, sec.:**	100	**L/R :** L **Shield :**	N
Finish Depth, ft. :	24.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Logging Operation Notes:

This borehole was logged in five log runs. The total logging depth achieved by the SGLS was 126 ft.

Analysis Information

Analyst : S.D. Barry

Data Processing Reference : MAC-VZCP 1.7.9 Analysis Date : 02/24/1998

Analysis Notes :

The pre- and post-survey field verification spectra for all logging runs met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from these spectra were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing correction factors for a 0.280-in.-thick steel casing (based on a 6-in., schedule-40 pipe) were applied to the entire logged interval during the analysis process.

Shape factor analysis was applied to the SGLS data and provided insights into the distribution of Cs-137 contamination and into the nature of zones of elevated total count gamma-ray activity not attributable to gamma-emitting radionuclides.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to

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calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

A plot of the shape factor analysis results is included. The plot is used as an interpretive tool to help determine the radial distribution of man-made contaminants around the borehole.

Two time-sequence plots of the historical gross gamma log data are presented. One presents data for the entire borehole from 1975 to 1992, and a second presents borehole data only for the interval of 70 to 100 ft from 1982 to 1993.

Results/Interpretations:

The man-made radionuclides Cs-137, Co-60, Eu-154, and Eu-152 were detected around this borehole. A region of excessive dead time was encountered from 3 to 4.5 ft. Cs-137 contamination was detected continuously from the ground surface to 19.5 ft (except in the region of high dead time). Co-60 contamination was detected between 82.5 and 88 ft. Eu-154 contamination was detected continuously from 1 to 3 ft and 4.5 to 6.5 ft. Eu-152 contamination was detected continuously from 1 to 2.5 ft and 5 to 6 ft.

The K-40 log plot shows an interval of slightly lower concentrations between approximately 8 and 14 ft. At a depth of 60 ft, the K-40 concentration values increase slightly.

An analysis of the shape factors associated with applicable segments of the spectra was performed for this borehole. The interpretations of the shape factor analysis are available in the Tank Summary Data Reports for tanks A-101 and A-102.

Additional information and interpretations of log data are also included in the main body of the Tank Summary Data Reports for tanks A-101 and A-102.